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ABSTRACT

A study examined the role of metadiscourse characteristics and level of student anxiety as they affect learning from social studies textbooks. Metadiscourse is defined as an author's overt or non-overt presence in the discourse in order to direct rather than inform readers--the linguistic material given to readers so they will understand what is said and what is meant in the primary discourse. Three general categories of metadiscourse--information, voice, and attitude--were added in varying combinations to a passage from a social studies textbook. One hundred twenty mostly white middle-class sixth-graders were tested for learning from these passages. Analyses of covariance, controlling for reading ability, revealed significant interaction effects involving metadiscourse and anxiety. As expected, high anxious students showed their best performance with first person voice and no attitudinal metadiscourse while low anxious students showed the opposite effect. These results indicated the importance of studying the joint effects of metadiscourse and anxiety as determinants of textbook reading. (Four tables of data, including examples of the metadiscourse variables and a sample of the test anxiety measure, are included, and 52 references conclude the report.) (SR)

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CENTER FOR THE STUDY OF READING

A READING RESEARCH AND EDUCATION CENTER REPORT

Technical Report No. 435

THE INTERACTION OF METADISCOURSE AND ANXIETY IN DETERMINING CHILDREN'S LEARNING OF SOCIAL STUDIES TEXTBOOK MATERIALS

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Abstract

The role of attitudinal, voice, and informational metadiscourse characteristics and level of student anxiety were studied as they affect learning from social studies textbooks for 120 sixth-graders. Analyses of covariance, controlling for reading ability, revealed significant interaction effects involving metadiscourse and anxiety. As expected, high anxious students showed their best performance with first person voice and no attitudinal metadiscourse while low anxious students showed the opposite effect. The importance of studying the joint effects of metadiscourse and anxiety as determinants of textbook reading is discussed.

THE INTERACTION OF METADISCOURSE AND ANXIETY IN DETERMINING CHILDREN'S LEARNING OF SOCIAL STUDIES TEXTBOOK MATERIALS[1]

The present study examines the effects of adding metadiscourse characteristics to a text on children's understanding of social studies textbook materials as a function of their level of test anxiety. To the authors' knowledge, this is the first experimental investigation systematically studying metadiscourse variables in a fully crossed orthogonal design. It is also the first attempt to relate evaluation anxiety to metadiscourse characteristics and social studies textbook learning and retention.

Metadiscourse

According to Williams (1985) metadiscourse is

> writing about writing, whatever does not refer to the subject matter being addressed. This includes all connecting devises such as *therefore, however,* and *in the first place*; all comment about the author's attitude: *I believe, in my opinion, let me also point out*; all comment about the writer's confidence in his following assertion: *most people believe, it is widely assumed; allegedly*; references to the audience: *as you can see, you will find that, consider now the problem of*. . . . (p. 226)

And according to Vande Kopple (1980), metadiscourse is writing that signals the presence of the author and that calls attention to the speech act itself. Vande Kopple (1985) notes that

> many discourses have at least two levels. On one level we supply information about the subject of our text. On this level we expand propositional content. On the other level, the level of metadiscourse, we do not add propositional material but help our readers organize, classify, interpret, evaluate, and react to such material. Metadiscourse, therefore, is discourse about discourse or communication about communication. (p. 83)

Metadiscourse, then, is an author's overt or non-overt presence in the discourse in order to direct rather than inform readers--the linguistic material given to readers so they will understand what is said and what is meant in the primary discourse. Thus, when authors use expressions such as *my purpose for you in this chapter is to, it is important to note that, perhaps,* and *surprisingly*, they are using metadiscourse. A survey of written texts reveals that authors from different cultures, writing in different time periods, disciplines, and genres use metadiscourse. Metadiscourse was used by the authors of old Greek and Roman comedies and poetry (e.g., Aristophanes, Plautus, Homer, Virgil, Ovid) and by Aristotle. Later authors used metadiscourse in their essays and treatises (e.g., Descartes, Locke, Montaigne, & Luther) and in their novels (e.g., Fielding, Sterne, Cervantes, Goethe, Dickens, & Eliot). More modern and contemporary authors use metadiscourse, too (e.g., novelists: Barthes, Fowler, Borjes, Calvino; scientists: Darwin, S. J. Gould; historians: Commager, Handlin). In addition, metadiscourse is frequently found in popular magazines and books and in technical articles, reports, and books (Crismore, 1985a; 1985b).

Armbruster and Anderson (1981, 1984) have been studying aspects of content area textbooks that seem to impede learning and retention and have identified four discourse properties that authors should attend to in order to produce "considerate" texts--texts that readers can comprehend without too much effort. The four discourse properties are: (a) structure--the ordering of ideas largely determined by the pattern of organization required by the purpose of the discourse; (b) coherence--how well sentences and ideas are woven together and flow into each other; (c) unity--the internal consistency of ideas, and the relevancy of everything to the purpose and controlling idea of the discourse; and (d) audience appropriateness--meeting the needs of the reader in regard to amount of explanation, detail, vocabulary and syntax, all based on the amount of background knowledge of the reader. These four properties, often found to be lacking in the content area textbooks analyzed by Armbruster and

Anderson, are properties of the primary discourse--the referential/propositional context of the content textbooks. Although there is no doubt that the primary discourse is an important aspect of content textbooks for discourse analysts and experimental researchers to study, the metadiscourse level of discourse also warrants close study.

The potential importance of metadiscourse has been suggested by scholars in different disciplines. A number of communication scholars, modern rhetoricians, and educators believe that when used appropriately, metadiscourse can guide and direct readers through a text by helping them understand the text and the author's perspective (Bradley, 1981; Williams, 1985; Winterowd, 1983), thereby making the text more friendly and considerate (Singer, 1986).

Booth (1961) discussed the many possible benefits that metadiscourse might have for readers: explanation; summaries of thought processes and mental states; orienting information; guidance of readers' expectations, intellectualizing, and emotional responses; harmony between author and reader; and identification with characters or the author. Possible additional effects on the reader are involvement with and support for an author who cares about the text, the reader, and the reader's involvement with the text.

In the present study, metadiscourse was classified into three general categories--informational, voice, and attitudinal with subtypes for each, based on Halliday's (1973) interpersonal and textural macro-functions of language. One of the assumptions in studies of language use and social interaction is that language functions to transmit referential information, as well as to create and sustain textural and expressive meanings (Halliday, 1978). The assumption in this study was that not only primary discourse but metadiscourse is used for both referential and expressive ends.

Metadiscourse functions on a referential, informational plane when it serves to direct readers in how to understand the primary discourse message by referring, for example, to its text structure and content and to the author's discourse actions ("I will describe X."), purposes, or goals. This referring can be on a global or local level. Metadiscourse functions on an expressive attitudinal plane when it serves to direct readers in how to take the author, that is, how to understand the author's perspective or stance toward the content or structure of the primary discourse. Attitudinal metadiscourse is the interpersonal aspect of language and includes types of what Halliday (1985) calls modality markers: probabilistic and evaluative author comments. Voice metadiscourse involves the presentation of informational or attitudinal metadiscourse in an interpersonal manner using first and second person pronouns (in this chapter I explain for you . . .) versus third person pronouns (this chapter traces the history of trade routes). Metadiscourse lengthens a text, and thus, it is one type of text elaboration. The assumption was that these types of metadiscourse help enhance comprehension (understanding the text as an objective document, e.g., summarizing/paraphrasing the propositional content) critical reading (understanding the text as a subjective document, e.g., identifying the author's attitudes and biases), and learning (remembering new information about the subject matter, author's attitudes, and discourse strategies).

The three general categories of metadiscourse were studied in a 2x2x2 orthogonal experimental design --*information*, *voice*, and *attitude*. *Information* reflects the textural functions of language; voice and attitude reflect the interpersonal function of language (Halliday, 1973). Each general category collapses several subtypes of metadiscourse considered important for the previously stated assumptions but which have been little or not tested before. For instance, logical connectives/relators such as *therefore* and *however* have been studied extensively (e.g., Crismore, 1981; Davison, 1982; McClure & Steffensen, 1980), and therefore were not included in the information category. Because of the numbers of subcategories of metadiscourse (Vande Kopple, 1985, lists seven classes and eight subclasses), only selected subcategories could be tested in this study. The subcategories selected for information consisted of text connectives, such as, topicalizers, reminders of material presented, previews of material to be presented, restatements and interpretation; commentary, such as,

announcements of purposes, rationales, and superordinate ideas; discourse strategy statements (Crismore, 1985a; 1985b; Vande Kopple, 1985).

In the general category of voice, first person singular and second person pronouns were collapsed into interpersonal voice to reflect a close author-reader alignment while third person pronoun was selected to reflect a more distant author-reader relationship. The subcategories selected for attitude consisted of validity/modality markers, such as, hedges and emphatics, and attitude markers (Crismore, 1985a, 1985b; Vande Kopple, 1985; Williams, 1985).

It was expected that the presence of metadiscourse would increase learning and retention of information of various kinds in the text passages. The rationale for this expectation is that metadiscourse provides a structure and framework for the text and an appropriate footing or alignment between author and reader (Dillon, 1986; Hardy, 1959). The informational metadiscourse might direct attention from less important to more important subject matter and structure information so that retention of the less significant details drops, but more important information rises. At the same time, the voice and attitudinal metadiscourse might increase retention of both important and less important subject matters and structure information as well as retention of information about the author's attitudes.

The intent was not to rewrite the content of the original text, but to add metadiscourse in the form of words, phrases, clauses, or even sentences. Informational metadiscourse was added to the text on two levels, global and local. On the global level, metadiscourse was added by attaching an elaborate preview and conclusion to each passage and by inserting sentences within the passage which dealt with global aspects of the passage content. On the local level, metadiscourse was added by attaching briefer previews and conclusions to the subparts of the passages and by attaching metadiscourse to the existing sentences identified as central or peripheral to the meaning, based on the focus of the text and the teacher's manual.

Informational metadiscourse was the first variable manipulated. Adding informational metadiscourse involves explicitly stating certain types of information (e.g., the superordinate idea, purpose, and author strategies). The second manipulated variable was *voice*, either interpersonal (first and second person pronouns) or impersonal (third person pronouns). *Attitudinal* metadiscourse was the third variable manipulated and involves adding attitude comments about the truth of the content (it was probably the case that . . .) or evaluative comments by the author (fortunately . . .).

Although a few discourse analysts have studied metadiscourse as it is used in spoken and written discourse (Lautamatti, 1978; Ragan & Hooper, 1981; Schiffrin, 1980) and some scholars have discussed it (e.g., Crismore, 1983; Vande Kopple, 1985; Williams, 1985), metadiscourse has been manipulated in only a few studies (e.g., Britton, Glynn, Meyer, & Penland, 1982; Meyer, 1975; Meyer & Rice, 1981; Vande Kopple, 1980).

Because of the scarcity of experimental studies, not much is known about the effects of metadiscourse variables. Meyer and her associates (1975; Meyer & Rice, 1981) have investigated the extent to which signaling (a type of metadiscourse providing information about the subclass of connectives labeled logical relators) has an effect on readers' recall of subject matter during reading for adults and ninth graders, but they found few significant effects of signaling on the subjects' recall of the expository passages read. Vande Kopple (1980) studied the extent to which readers recalled emphatics (a subtype of metadiscourse which expresses an author's certainty about the propositional content of sentences and which belongs to the class called modality markers) that were attached to sentences in expository paragraphs and also the extent to which emphatics affected the recall of the text material. He found that students did not recall the initial emphatic metadiscourse part of a sentence as well as they did the propositional content part in the remainder of the sentence. Support for the role of voice has been found in a study (Crismore & Vande Kopple, 1988) of the effects of hedges (a type of attitudinal metadiscourse) on ninth graders' retention of material in science and social studies passages. Students

who read science passages and social studies passages with hedged material presented in personal voice (first person pronoun) learned more than those who read them in impersonal voice (third person pronouns).

These experimental studies did not show many general effects of signaling or metadiscourse on readers' recall of the propositional content or of metadiscourse itself. Except for Crismore and Vande Kopple's study (1988), the studies of signaling and metadiscourse reviewed here used adults or high school students as subjects, short passages adapted from periodicals, and only certain types of metadiscourse. No one has yet examined the effects of a broader range of metadiscourse types in content area textbooks or the interactions of metadiscourse and level of anxiety for children.

Historically, metadiscourse has been used in social studies textbooks. In her book *America Revised: History Textbooks in the Twentieth Century*, Frances FitzGerald (1979) notes that at the turn of the century, history textbooks had single historian authors who typically wrote readable, memorable textbooks with style and stance. They wrote because they had something to say about history, and therefore, their prose style was natural, personal, opinionated, and vivid. Their textbooks had an atmosphere about them and left an impression on students--qualities usually lacking in today's textbooks but often found in social studies texts written by popular writers for general audiences. A recent analysis of school and non-school social studies texts (Crismore, 1984) found both qualitative and quantitative differences in the use of metadiscourse. Typical textbooks contained little metadiscourse, and when they did, it was in formulaic expressions presented impersonally or imperatively. Nonschool texts contained over five times as much metadiscourse of the kind expressing the authors' attitude as did the textbooks. Further, metadiscourse was used extensively in nonschool social studies texts written for both academic and popular audiences.

Anxiety

In the present study, effects of metadiscourse were also related to anxiety. Anxiety has long been known to be a major determinant of children's learning and performance throughout the elementary school years (Hill, 1980; I. G. Sarason, 1980; S. B. Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960). By the late elementary school years, the age of subjects in the present study, low anxious students are over 2 years ahead of high anxious students in reading and arithmetic test performance, and, in addition, have much higher report card grades in all academic subjects (Hill & Sarason, 1966). More generally, low anxious children perform significantly better than their high anxious counterparts on a wide variety of cognitive, learning, and problem-solving activities given under normal evaluative conditions (Dusek, 1980).

Recent experimental studies involving standard and optimal testing conditions have shown that test anxiety is the causal factor in the negative correlation between test anxiety and test/school performance (Hill, 1984). In these studies, high anxious students performed much below low anxious students when tested under the typical demands and stress of standardized testing. Under optimal testing conditions in which the pressures and stresses of testing (such as time pressure) were removed, however, high anxious students showed strong, immediate gains in performance and caught up with low anxious students. The studies indicate that the low performance of high anxious students under standard testing conditions is due to anxiety and stress, as opposed to not knowing the material.

Anxiety does not always interfere with learning and retention. High anxious children perform as well and sometimes better than low anxious children when evaluative aspects of the performance situation are relaxed, for example, by removing time pressure in testing situations (Hill & Eaton, 1977; Plass & Hill, 1986), removing evaluation altogether in a problem-solving situation, by having the student answer anonymously (Hill, 1980; Williams, 1976), by using non-school-like tasks (Lekarczyk & Hill, 1969), or by making a problem-solving situation game-like (Ruebush, 1963). Most relevant to the present study, performance of anxious and fearful children is facilitated when an adult evaluator (tester, teacher, etc.) relates to the child in a positive, personal way, and provides positive feedback (Hill, 1972, 1977, 1980;

Zigler, Abelson, & Seitz, 1973; Zigler & Butterfield, 1968; Zigler & Harter, 1969). Thus, anxiety can either facilitate or debilitate performance depending on the nature of the task and the evaluative nature of the situation.

Hypotheses interrelating the effects of anxiety and metadiscourse variables were tested in the present study in an orthogonal experimental design in which low and high anxious students were presented social studies passages involving the eight possible combinations of the three metadiscourse variables (attitude, voice, and information) either being added to the passage or not. It was hypothesized that addition of the attitudinal metadiscourse characteristic (e.g., probabilistic comments) would interfere with performance of high test anxious children. The attitudinal parameter may complicate the child's learning and retention of the text by adding to the existing subject metadiscourse propositions that add uncertainty to the situation, for example, through terms like ". . . it is possible that." High anxious students do not like ambiguity, do not like to answer questions unless they are fairly sure of their response (Goulet & Mazzei, 1969), and perform particularly poorly on problem-solving tasks involving difficult discrimination and considerable information processing (Hill, 1980). The attitudinal dimension, then, should make the learning of the social studies text more difficult in just the ways that debilitate performance of high anxious but not low anxious students so that an interaction between attitude and anxiety would occur.

It was expected that the voice metadiscourse parameter on the other hand, adding an interpersonal (first and second person pronouns) as opposed to impersonal (third person pronouns) quality to the text materials, would facilitate performance of high anxious students but not low anxious students. As noted, high anxious students do better in classroom learning as well as testing situations when an adult interacts in a personal way and the situation is more relaxed and less strictly evaluative. It was reasoned that the interpersonal voice could have a similar effect when children are reading. Low anxious children, in contrast, have been found to do less well under testing conditions designed to reduce evaluation and pressure (Hill, 1984) and might be unaffected or even perform worse when interpersonal voice is added to a test.

The effects of adding informational metadiscourse to the text was viewed as an empirical question. Such information could facilitate performance of children in general (and high anxious children in particular) if the text was difficult and children could use the information to help learn the passage.

Methods

Subjects

The subjects were 120 sixth grade children who came from mostly white middle-class families and who lived near a large midwestern university. They were enrolled in five social studies classes taught by the same teacher and were homogeneously grouped according to ability as measured by scores from standardized tests. The children were assigned in equal numbers to the eight experimental conditions by first stratifying them on the basis of reading comprehension scores ($\underline{M}$ = 66.83; $\underline{SD}$ = 24.52) obtained from school records (Stanford Achievement Test, 1973), and then within each stratified level, randomly assigning students to experimental conditions. Since the sample was stratified, the groups, of course, did not differ in reading ability, as evidenced by the results of descriptive analyses. The reading comprehension scores were used later as a covariate in order to control for reading ability. On the basis of scores from the Social Studies Comfort Index (SSCI) described below, children were then assigned to either a High Anxious or Low Anxious group. The children did not have access to films, workbooks, study guides, or teacher/student discussion on the topic of the passages studied, and they read the experimental materials independently.

Materials

The materials selected for the children to read consisted of three passages of approximately 1,000 words each, taken from chapter 6 of the Ginn Grade 6 social studies textbook currently used in the subjects' classroom (Dawson, Tiegs, & Adams, 1979). The chapter concerned the later half of the Middle Ages in Europe. The original passages used for the study were written in third person voice (except for map references, which were omitted) and none contained the informational or attitudinal metadiscourse under study.

Procedures

The tasks for this study were presented to the children over a period of 5 days. On Day 1 they took a prior knowledge test and the Social Studies Comfort Index (SSCI) as pretests. On Day 2, the children were told that the researcher had a friend named Pat, who had written a new kind of social studies textbook and who wanted to try out with them a chapter on the Middle Ages that was divided into three passages. The children were then given Passage 1 to read and told to take as long as necessary to read it. Next they took a multiple choice, retention test over the passage. The children read all three passages in the same experimental condition. The same procedure was followed on Day 3 and Day 4. On Day 5 the Social Studies Comfort Index was administered again as a posttest.

Variables Manipulated

The three types of metadiscourse--informational, voice, and attitudinal--were added to the original text in the form of words, phrases, or clauses, or by varying the voice. Informational metadiscourse was added by explicitly stating certain types of information (e.g., topic, thesis, purpose, significance, structure, and discourse acts). The manipulation of voice involved using either interpersonal (first and second person pronouns) or impersonal (third person) pronouns. Attitudinal metadiscourse was the third variable manipulated and involved adding comments about the truth of content (it seems to be...) or evaluation by the author (it is interesting that . . .).

The social studies passages were written in the eight possible combinations of adding or not adding the three metadiscourse variables of voice, attitude, and information. For example, one passage had no metadiscourse added, a second passage added only voice metadiscourse, another added both voice and attitude, and one passage added all three metadiscourse variables. Examples of various combinations of the three metadiscourse variables are presented in Table 1. For each passage the presence or absence of each metadiscourse variable is indicated. As can be seen in Table 1, the first passage illustrates the original text without any metadiscourse added, intermediate passages add different combinations of metadiscourse, and the final passage adds all three variables (information, voice, and attitude).

[Insert Table 1 about here.]

Pretest Measures

Two instruments, one cognitive and one affective, were devised as pretests and pilot tested with a group of sixth grade children from another state. The first was a background knowledge test and the second an affective comfort index, which was also administered as a posttest. The pilot test data indicated the test scores showed wide variability for the children chosen for the piloting and seemed to have good face validity.

Prior knowledge test. The prior knowledge test was designed to measure how much prior knowledge the children had about the subject matter, the middle ages. It consisted of 10 multiple choice items, covering the early and later parts of the Middle Ages. Analyses revealed little difference in means and standard deviation for the prior knowledge test scores ($\underline{M}$ = 7.77, $\underline{SD}$ = 8.18).

Text anxiety measure. The 10-item Social Studies Comfort Index (SSCI) questionnaire used in the present study was adapted from the Test Comfort Index (TCI) (Hill, 1980; Sarason, 1980). The TCI asks students if they feel relaxed in a variety of test situations. The 7-item TCI has been found to have good reliability and predictive validity (Harnisch, Hill, & Fyans, 1980) and has been used successfully in a number of basic research and educational intervention studies (Hill, 1984). The SSCI adapted the 7 items of the TCI to the social studies testing context and added 3 items, 1 for each of the three metadiscourse characteristics under study. The questions asked students how relaxed or nervous they felt in social studies reading and writing situations. The SSCI is presented in full in Table 2.

[Insert Table 2 about here.]

Students answered each question on a 4-point SSCI scale from "very relaxed" to "very anxious." (The SSCI is shown in Table 2.) The reliability coefficient (Cronbach's Alpha) was .89 for the total preSSCI, .73 for Form A, and .74 for Form B when the test was split randomly, indicating good internal consistency for all items. The reliability of the SSCI is also indicated by the correlation of the preSSCI scores with the postSSCI scores ($\underline{r}$ = .58), even though these were administered 8 days apart, with the experiment intervening. The maximum score for the SSCI was 40.00; for the preSSCI ($\underline{M}$ = 19.86; $\underline{SD}$ = 4.91) and for the postSSCI ($\underline{M}$ = 20.19; $\underline{SD}$ = 6.09), illustrating the consistency of the measure.

Dependent Measure

Passage test. A four-choice/multiple-choice test was designed to measure the children's awareness and retention of various kinds of information in the passage. The test was pilot tested with a class of sixth graders from the same school who were not in the study in order to eliminate items that were unclear, too easy, or misleading.

The passage test was a multiple choice measure with six subtests, and these separate subscores were obtained for each of these categories: (a) central ideas (high level information either all stated or partly stated, depending on the experimental condition) manipulated by *informational metadiscourse* (CIM); (b) central ideas (high level information stated in the passages) unmanipulated by metadiscourse (CIU); (c) peripheral ideas (lower level information stated in the passage) manipulated by *attitudinal metadiscourse* (PIM); (d) peripheral ideas (lower level information stated in the passage) unmanipulated by metadiscourse (PIU); (e) discourse acts structure (the author's text plan and strategies) manipulated by *informational metadiscourse* (DAS); and (f) author attitude toward ideas manipulated by *attitudinal metadiscourse* (AAI). There were 144 test questions across the three, 1000-word passages for the total passage test and 48 test questions for each passage test: CIM, 35 items total (Stated central ideas = 18; thesis, purpose, rationale, interpretation items, either stated or to be inferred, depending on the experimental condition = 17; CIU, 21 items total; PIM, 17 items total; PI, 38 items total; DAS, 12 items total; and AAI, 21 items total.

The reliability coefficient (Cronbach's Alpha) for the total passage test was .93, indicating good internal consistency for all the items. Several approaches were used to validate the central/peripheral distinction among items in the test. The first approach involved reviewing the passages and teacher's manual to write questions testing information that was the focus of the text and manual and testing information that was tangential. The second approach involved asking people to judge the passage questions as to whether the information tested was central or peripheral in order to see if their judgments would confirm the distinction used in writing the questions. A total of 40 raters were used for interraters validation, both academics and non-academics, with the academics having a higher percentage of agreement for peripheral ideas, .73 vs. 46 and the nonacademics a higher percentage of agreement for central ideas, .70 vs. 48.

Design. The experimental design involved randomly assigning 15 subjects to each of the 8 experimental conditions determined by the information, voice, and attitudinal variables with the restriction that groups were balanced on the number of students of high and low reading ability. Individual differences

in reading ability (within groups) were controlled by partialling out reading ability in the analyses of text reading achievement. As in many previous studies, children were blocked into high and low test anxiety groups in each cell based on the median SSCI test anxiety score (score of 20) for the sample as a whole (Hill, 1984). This procedure results in no loss of sample size and provides a conservative test of anxiety effects. The anxiety scores of the high anxious group had a mean of 24.0, the low anxious group a mean of 16.7. A 2(Information) x 2(Voice) x 2(Attitude) x 2(Comfort Index) ANCOVA was carried out with reading ability partialled out.

Results

The 2(Information) x 2(Voice) x 2(Attitude) x 2(Anxiety) ANCOVA of the Social Studies test, with reading achievement test performance covaried out, revealed three significant effects.

The major finding in the present study was the triple interaction of Voice x Attitude x Anxiety (F = 5.89, df = 1/92, $p < .05$). The eight adjusted means bearing on this interaction are presented in Table 3. As expected, the joint effects of voice and attitude are opposite for high versus low anxious students. As can be seen in Table 3, high anxious students show their best learning when interpersonal voice metadiscourse is present and attitude metadiscourse is absent, with performance of these children fairly similar in the other three cells. In contrast, performance of low anxious students is lowest when both interpersonal voice is present and attitude is absent, again with performance of these students similar in the other three conditions. These findings indicate that the combination of adding voice metadiscourse but not attitudinal metadiscourse facilitates performance of high anxious children, as expected, but interferes with the performance of low-anxious children.

[Insert Table 3 about here.]

The pattern of means in the three-way interaction of Voice x Attitude x Anxiety also resulted in a significant two-way interaction in the predicted direction between attitude and anxiety (F = 4.19, df = 1/92, $p < .05$). High anxious students perform worse when attitudinal metadiscourse is added than when it is not, whereas low anxious students do better when attitudinal metadiscourse is present. These results again suggest that attitude metadiscourse interfered with the learning of high anxious students but facilitated the learning of low-anxious students.

There also was a significant three-way interaction between information, voice, and anxiety in the present study, (F = 6.76, df = 1/92, $p < .01$). Table 4 depicts the adjusted means for the eight groups determining this Information x Voice x Anxiety interaction. As can be seen in the information-present condition, high anxious students do much better, as expected, when interpersonal voice is added to the text than when it is not, whereas low anxious students do better when interpersonal voice is not present. In the information-absent condition, in contrast, performance is very similar among the four anxiety-voice groups. These results suggest that the addition of first person voice metadiscourse facilitated learning of high anxious but not low anxious students, as expected, but primarily in the information-present condition.

[Insert Table 4 about here.]

Because the children were reading an intact chapter from their social studies textbook for ecological reasons, the three passages were not counterbalanced, making passage effects a possibility. However, the average means for the total population for the three passage test scores were quite similar: Passage 1, 20.74; Passage 2, 21.42; and Passage 3, 20.87.

Discussion

The major results of the present study involved hypothesized interactions between anxiety and the three metadiscourse variables of voice, attitude, and information condition. As predicted, high anxious

students did much better on the social studies test when voice metadiscourse was added and attitudinal was not. Conversely, low anxious students did poorly in this same condition. This combined differential effect of voice and attitude on low versus high anxious students was seen directly in the significant triple interaction between voice, attitude, and anxiety. The separate effects of voice and attitude on low versus high anxious students also appeared for attitude in the Attitude x Anxiety double interaction, and for voice in the information present condition as part of the Information x Voice x Anxiety triple interaction.

It had been expected that the more positive, supportive, interpersonal nature of the voice metadiscourse would relax and calm high anxious students and help them concentrate on the social studies text material. For less anxious students, the interpersonal voice may serve more as a distractor from their processing the text information. It also had been expected that attitude metadiscourse involving evaluative comments and probability statements would interfere with performance of high anxious students because it adds ambiguity and complexity to the learning situation, factors which usually lead to low performance or failure of these children in evaluative situations. For low anxious students, in contrast, the ability and complexity involved in reading attitudinal discourse may make the task more interesting and challenging.

It is not clear why the impact of voice alone on low versus high anxious students was obtained primarily in the information condition. The impact of attitude alone and Attitude x Voice together were both independent of the information condition. The results suggest that it will be of value to include the information condition variable in future studies in this area.

The results clearly suggest the importance of both metadiscourse variables and anxiety as determinants of social studies text mastery. In the present study results were joint rather than additive, that is, it was the combined presence of interpersonal voice and the absence of attitudinal metadiscourse that facilitated the performance of high anxious but interfered with the performance of low anxious subjects. Voice and attitude did, however, interact separately with anxiety in 3-way (with information condition in the case of voice) or 2-way interactions. It would appear fruitful to include motivational variables such as anxiety as one focus in future research on metadiscourse.

Although some of the present results interrelating metadiscourse variables and social studies anxiety were clear and rather strong, they probably just scratch the surface in terms of understanding the full impact of these variables on children's mastery of social studies text materials. Other metadiscourse variables such as location and intensity need to be considered and each metadiscourse variable needs to be broken down into its component parts (e.g., evaluative versus probability aspects of attitude). Other forms of achievement motivation need to be considered in addition to anxiety. For example, the factors children attribute their successes and failures to, such as ability, effort, and luck, are major determinants of learning and performance and interact in predictable ways with anxiety effects (Hill, 1984; Willig, Harnisch, Hill, & Maehr, 1983).

The relation of metadiscourse and anxiety to teacher style and classroom climate variables is another intriguing area for future research (Ames & Ames, 1984). Do teachers who use a more personal, child-oriented style also use first person voice metadiscourse and less formal evaluative procedures in their classrooms that facilitate the positive motivation and learning of high anxious students? Do teachers who are more subject-oriented use more impersonal voice and more formal, evaluative procedures which prove to be more effective with low anxious students?

The present results are far too tentative, to be sure, to even consider suggesting possible changes in textbook styles, but textbook writers and users should be aware of such findings. If future research reveals broader and stronger effects of metadiscourse variables impacting differentially on low and high anxious students, some helping one group, some the other, then eventually some kind of change in text materials or presentations of the text materials may want to be considered. Any given content area textbook will no doubt continue to be written in one style because of the structure of schools,

economics, and tradition. However, if it becomes more and more clear that different children learn best from text materials written in different styles, some kind of change in teaching will be desirable. Publishers might meet this need by developing a different style(s) for supplementary printed or computer software materials. Teachers could develop and teach review, summary, and other materials in different styles. Teachers might also add metadiscourse factors such as voice, attitude, and information when reading/lecturing to the class, leading class discussion, or showing students how to help (teach) each other (Peng, 1986). If some adjustment is not made, many students will be mastering social studies texts far less well than they can. At the very least, textbook writers and teachers should be aware that low and high anxious students may show very different learning and retention rates depending on what particular metadiscourse parameter values are present in a text, for example, first person personal versus third person interpersonal voice.

Metadiscourse and motivation variables, working in tandem, may prove, in fact, to be extremely important joint determinants of children's learning and retention of social studies and other material. This possibility appears worthy of further research.

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Table 1

Examples of the Metadiscourse Variables

1. Regular Text (no metadiscourse: no information, no attitude, third person voice).

   During the early Middle Ages, most Europeans knew little about other parts of the world. Their lives were ruled by the promises that were part of the feudal system.

2. Text with Informational Metadiscourse only added (information and third person voice but no attitude)

   Part One reviews the early Middle Ages. The way it does this is *by describing* what life was like during that time. *The main idea here* is that the early Middle Ages was a time without learning and freedom for most people.

   During the early Middle Ages, most Europeans knew little about other parts of the world. Their lives were ruled by the promises that were part of the feudal system.

3. Text with Voice and Information Metadiscourse Added (information and first person but not attitude).

   In *Part One I review for you* the early Middle Ages. The way *I* do this is *by describing* what life was like during that time. The *main idea I am trying to get across to you* here is that the early Middle Ages was a time without learning and freedom for most people.

   During the early Middle Ages, most Europeans knew little about other parts of the world. Their lives were ruled by the promises that were part of the feudal system.

4. Text with Attitudinal Metadiscourse only added (attitude and third person voice but no information).

   Unfortunately, (during the early Middle Ages, most Europeans knew little about other parts of the world). *Unfortunately, also*, (their lives were ruled by the promises that were part of the feudal system).

5. Text with voice and Attitudinal Metadiscourse Added (Attitude and first person voice but no information).

   I think it unfortunate that (during the early Middle Ages most Europeans knew little about other parts of the world). *I also find it unfortunate that* (their lives were ruled by promises that were part of the feudal system).

6. Text Informational and Attitudinal Metadiscourse Added (in third person voice).

   Part one reviews the early Middle Ages. The way it does this is *by describing* what life was like during that time. *The main idea here is that* the early Middle Ages was a time without learning and freedom for most people.

   It was unfortunate that (during the early Middle Ages, most Europeans knew little about other parts of the world). It is also unfortunate that (their lives were ruled by the promises that were part of the feudal system).

Table 1 (Continued)

7. Text with Voice only Added (but no attitudinal or informational metadiscourse).

   I found that (during the early Middle Ages, most Europeans knew little about other parts of the world. Their lives were ruled by the promises that were part of the feudal system).

8. Text and All Three Metadiscourse added (informational, first person voice, attitudinal).

   In *Part One I review for you* the early Middle Ages. The way *I* do this is *by describing* what life was like during that time. The *main idea I am trying to get across to you here is that* the early Middle Ages was a time without learning and freedom for most people.

I think it is unfortunate that (during the early Middle Ages,most Europeans knew little about other parts of the world). *I also find it unfortunate that* (their lives were ruled by the promises that were part of the feudal system. People had to obey the lord who gave them their land. *This meant that* everyone was under the rule of someone else. The serfs were almost like slaves.)

Table 2

Social Studies Comfort Index

1. How do you feel when the teacher says that he or she is going to ask the class to read part of a social studies chapter to see how well you have learned something

   a. Very relaxed
   b. Kind of relaxed
   c. Kind of nervous
   d. Very nervous

2. How do you feel if you have to write about social studies?

   a. Very relaxed
   b. Kind of relaxed
   c. Kind of nervous
   d. Very nervous

3. How do you feel about your being able to understand what the author says when you are doing a social studies reading assignment?

   a. Very relaxed
   b. Kind of relaxed
   c. Kind of nervous
   d. Very nervous

4. How do you feel about your being able to write down the author's main ideas when you are doing a social studies reading assignment?

   a. Very relaxed
   b. Kind of relaxed
   c. Kind of nervous
   d. Very nervous

5. How do you feel about your being able to finish reading a whole social studies reading assignment?

   a. Very relaxed
   b. Kind of relaxed
   c. Kind of nervous
   d. Very nervous

6. How do you feel about your being able to "get into" and become interested and involved with the social studies reading assignment?

   a. Very relaxed
   b. Kind of relaxed
   c. Kind of nervous
   d. Very nervous

Table 2 (Continued)

7. How do you feel *while* you are reading a social studies assignment?

   a. Very relaxed
   b. Kind of relaxed
   c. Kind of nervous
   d. Very nervous

8. How do you feel about how well you will do when the teacher gives the class a social studies reading assignment?

   a. Very relaxed
   b. Kind of relaxed
   c. Kind of nervous
   d. Very nervous

9. How do you feel when the author puts himself or herself into the social studies text and uses "I," "Me," or "You?"

   a. Very relaxed
   b. Kind of relaxed
   c. Kind of nervous
   d. Very nervous

10. How do you feel when the author uses words like *I think, I believe, It seems to me, probably,* or *possibly*?

    a. Very relaxed
    b. Kind of relaxed
    c. Kind of nervous
    d. Very nervous

Table 3

Means Determining the Significant Voice X Attitude X Anxiety Three-way Interaction (Adjusted Means)

I. Low Anxious Students

	Voice Metadiscourse	
Attitude Metadiscourse	Present	Absent
Present	71.90	69.61
Absent	59.35	66.80

II. High Anxious Student

Attitude Metadiscourse	Present	Absent
Present	59.66	63.11
Absent	74.03	58.12

Table 4

Means Determining the Significant Voice X Anxiety X Information Three-way Interaction (Adjusted Means)

I. Information Metadiscourse Present

	Voice Metadiscourse	
Anxiety Level of Student	Present	Absent
Low Anxious	65.98	76.00
High Anxious	70.30	55.78

II. Information Metadiscourse Absent

Anxiety Level of Student	Present	Absent
Low Anxious	65.28	60.42
High Anxious	63.39	65.45

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